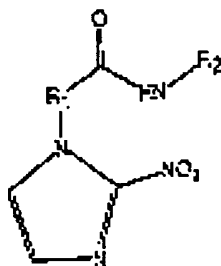


What is claimed is:

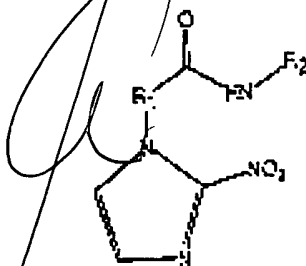
1. A compound having the formula:



wherein R<sub>1</sub> is CH<sub>2</sub>; and R<sub>2</sub> has the formula CH<sub>2</sub>CX<sub>2</sub>CHX<sub>2</sub>, wherein X is halogen or hydrogen  
5 and at least 1 carbon atom of said alkyl group is bound with at least one halogen atom.

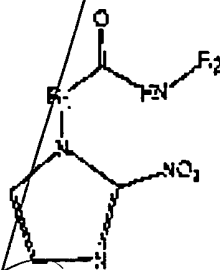
2. The compound of Claim 1 wherein the halogen atom is fluorine.
3. The compound of Claim 1 wherein the halogen atom is bromine.
4. The compound of Claim 1 wherein R<sub>2</sub> is CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>Br.
5. The compound of Claim 1 wherein R<sub>2</sub> is CH<sub>2</sub>CF<sub>2</sub>CH<sub>2</sub>Br.
- 10 6. The compound of Claim 1 wherein R<sub>2</sub> is CH<sub>2</sub>CF<sub>2</sub>CHFBr.
7. The compound of Claim 1 wherein R<sub>2</sub> is CH<sub>2</sub>CF<sub>2</sub>CHBr<sub>2</sub>.
8. The compound of Claim 1 wherein R<sub>2</sub> is CH<sub>2</sub>CF<sub>2</sub>CH<sub>2</sub>F.

9. The compound of Claim 1 wherein  $R_2$  is  $\text{CH}_2\text{CF}_2\text{CH}_2\text{F}$ .
10. The compound of Claim 1 wherein  $R_2$  is  $\text{CH}_2\text{CF}_2\text{CHF}_2$ .
11. The compound of Claim 1 wherein  $R_2$  is  $\text{CH}_2\text{CHFCH}_2\text{F}$ .
12. The compound of Claim 1 wherein  $R_2$  is  $\text{CH}_2\text{CHFCHF}_2$ .
- 5 13. A compound bound to a protein, the compound having the formula:



wherein  $R_1$  is  $\text{CH}_2$ ; and  $R_2$  has the formula  $\text{CH}_2\text{CX}_2\text{CHX}_2$ , wherein X is halogen or hydrogen and at least 1 carbon atom of said alkyl group is bound with at least one halogen atom.

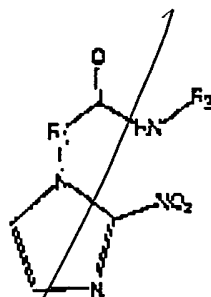
14. A method for preparing a monoclonal antibody comprising:  
introducing into a mammal a compound bound to a protein, the compound having the  
formula:



5 wherein R<sub>1</sub> is CH<sub>2</sub>; and R<sub>2</sub> has the formula CH<sub>2</sub>CX<sub>2</sub>CHX<sub>2</sub>, wherein X is halogen or hydrogen  
and at least 1 carbon atom of said alkyl group is bound with at least one halogen atom; and  
fusing immune cells of the mammal with mammalian myeloma cells forming a  
hybridoma that produces antibodies specific for the compound bound to the protein.

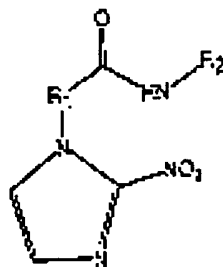
15. The method of claim 14 wherein R<sub>2</sub> is CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>F.

10 16. A monoclonal antibody specific for a compound, the compound's protein  
conjugate, the compound's reductive byproduct, or adduct formed between The compound  
and tissue protein, the compound having the formula:



wherein  $R_1$  is  $\text{CH}_2$ ; and  $R_2$  has the formula  $\text{CH}_2\text{CX}_2\text{CHX}_2$ , wherein X is halogen or hydrogen and at least 1 carbon atom of said alkyl group is bound with at least one halogen atom.

17. The monoclonal antibody of claim 16 wherein the halogen atom is fluorine.
18. The monoclonal antibody of claim 16 wherein  $R_2$  is  $\text{CH}_2\text{CH}_2\text{CH}_2\text{F}$ .
19. A biological reagent kit comprising the monoclonal antibody of claim 16 bound to a detection moiety.
20. A method for detecting tissue hypoxia in a mammal comprising: introducing into the mammal a compound having the formula:

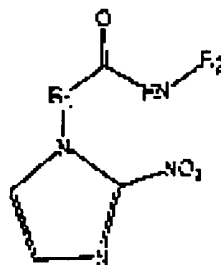


wherein  $R_1$  is  $CH_2$ ; and  $R_2$  has the formula  $CH_2CX_2CHX_2$ , wherein X is halogen or hydrogen and at least 1 carbon atom of said alkyl group is bound with at least one halogen atom; and imaging the portion of the mammal containing the tissue.

21. The method of claim 20 wherein the detection technique is PET.

5 22. The method of claim 20 wherein  $R_2$  is  $CH_2CH_2CH_2^{18}F$  and the detection technique is PET.

23. A kit for detecting tissue hypoxia comprising a compound having the formula:



10 wherein  $R_1$  is  $CH_2$ ; and  $R_2$  has the formula  $CH_2CX_2CHX_2$ , wherein X is halogen or hydrogen and at least 1 carbon atom of said alkyl group is bound with at least one halogen atom; a protein; a monoclonal antibody specific for the compound the compound's protein conjugates, the compound's reductive by product, or adduct formed between the compound and tissue protein; standards comprising the compound bound to a protein; a monoclonal antibody bound  
15 to a detection moiety; and detection moieties.

24. The kit of Claim 23 wherein compound is bound to lysozyme, albumin, or Bowman Birk inhibitor.

- 34 -
- wherein  $R_2$  is  $CH_2CH_2CH_2F$  and
- n 23 wherein the detection moiety

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